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Attorney Docket No. 14395-1

REMARKS

Claims 1 to 45 are currently pending in this application. Claims 1 to 45 have been rejected. In view of the following remarks, Applicant submits that this application is in condition for allowance. Accordingly, reconsideration and a timely indication of allowance are respectfully requested.

Rejections Under 35 U.S.C. § 102(b)

The Examiner rejected claims 1-4, 12-18, 20-22, 29-32, and 36-42 under 35 U.S.C. § 102(b) as being anticipated by Joko et al. (U.S. Patent No. 5,939,861). The Examiner's rejection has been carefully considered but is traversed for the reasons that follow.

The present invention comprises a system and method for modeling or simulating an application environment in order to analyze the effect of a particular battery and/or charger within the application environment. As explained on page 2 of the specification, many industrial applications use electric powered vehicles for consecutive shifts without an extended recharging period. There may be various breaks for coffee, meals, or shift changes during which recharging can take place. The cyclical use of equipment in an industrial application means that the energy needs are somewhat consistent over a cycle, that there is a fixed amount of time available for recharging, and that it is important that the equipment remain operating without requiring battery changes. The present invention is directed to a method for calculating the energy needs and providing an appropriate charge return model for a particular electric vehicle in a particular industrial use.

Independent claim 1 recites a method of modeling energy transfer “for an application environment”, such as an electric vehicle, that utilizes a battery as an energy source. The method comprises the step of: “receiving sensor data for the application environment, the sensor data being related to energy consumption.” As explained in paragraph 33 and Table 2 of the specification, the sensor data may include, for example, the time, the voltage at the beginning and at the end of an interval, the current at the beginning and at the end of the interval, the

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maximum and minimum voltage over the interval, and the maximum and minimum current over the interval. Other information may be included such as the charge delivered to the battery in the time interval, the discharge delivered by the battery over the time interval, and temperatures sensed during the interval.

The method also comprises the step of: "receiving one or more charge parameters for the battery." As explained in paragraph 38 of the specification, the charge parameters may include, for example, the operating or charging schedule, ambient temperature and altitude. The method further comprises the step of: "determining the energy transfer profile for the energy consumer based upon the sensor data, said step including determining one or more energy needs for the application environment and applying a charge return model based upon the charge parameters." Finally, the method includes the step of "making available the energy transfer profile."

As detailed below, none of the references cited by the Examiner teach or suggest "determining one or more energy needs for the application environment and applying a charge return model based upon the charge parameters," as recited in claim 1.

Joko et al., are concerned with observing the state of a battery in a hybrid gasoline-electric automobile. More specifically, Joko et al. disclose and teach a means for calculating the time integral I of the charging and discharging current (i) (Column 12, ll. 53-58). According to Joko et al., this information is used to compare the measured transfer characteristic of a specific battery in use to a set of stored characteristics to evaluate the condition of the battery and prevent battery damage through overcharging (Column 18, ll. 52-58). The hybrid vehicles focused on by Joko et al. do not have set discharge and charge schedules, because the vehicles can travel different routes with highly variable opportunities for regenerative braking. Therefore, Joko et al. do not attempt to anticipate the application environment needs, but rather focus on the state of the battery.

As compared to the subject invention, Joko et al. do not disclose, teach or suggest a method of modeling energy transfer "for an application environment" as recited in independent

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claim 1. Additionally, Joko et al. do not teach or suggest the limitation of “determining one or more energy needs for the application environment and applying a charge return model based upon the charge parameters,” as recited in claim 1. Moreover, because of the highly variable discharge and regenerative braking regimens of hybrid vehicles, it would not be obvious to one skilled in the art to modify Joko et al. to determine the energy needs for an application environment and apply a charge return model based upon the charge parameters as claimed.

Accordingly, Applicant respectfully submits that claim 1 is patentable over Joko et al., because Joko et al. do not teach or suggest each and every feature recited in claim 1. Claims 2 to 4, and 12 to 15 depend from claim 1 and by definition contain all of the limitations of claim 1. Accordingly, Applicant respectfully submits that claims 2 to 4 and 12 to 15 are patentable over Joko et al. for the reasons given above for claim 1 as well as because of the additional limitations contained therein.

Independent claim 16 is directed a method for generating an energy transfer profile for a vehicle utilizing a battery as an energy source. The method comprises the step of: “receiving recorded sensor data for the vehicle relating to energy consumption over time.” The method also comprises the steps of: “receiving a plurality of parameters including one or more charge parameters through a user interface; generating the energy transfer profile for the vehicle based upon said recorded sensor data and said parameters; determining an energy requirement for the vehicle and applying a charge return model based upon said charge parameters; and outputting the energy transfer profile.”

As explained above with regard to claim 1, Joko et al. focus on energy consumption of the battery and preventing overcharging, not the consumption of the vehicle. Accordingly, Applicant respectfully submits that Joko et al. fail to teach the limitations of “generating the energy transfer profile for the vehicle based upon said recorded sensor data and said parameters; determining an energy requirement for the vehicle and applying a charge return model based upon said charge parameters; and outputting the energy transfer profile.”

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Additionally, Applicant respectfully submits that Joko et al. fail to teach “receiving a plurality of parameters including one or more charge parameters through a user interface” as recited in claim 16. The Examiner states that Joko et al. teaches a user interface as 26 in Fig. 15. However, as seen from Fig. 15, reference numeral 26 is directed to a display means with no user interface for entry of one or more charge parameters.

Accordingly, Applicant respectfully submits that claim 16 is patentable over Joko et al., because Joko et al. fail to teach or suggest all of the limitations of claim 16. Claims 17 and 18 depend from claim 16 and by definition contain all of the limitations of claim 16. Accordingly, Applicant respectfully submits that claims 16 and 17 are patentable over Joko et al. for the reasons given above for claim 16 as well as because of the additional limitations contained therein.

Since independent claims 20, 29 and 40 include similar features to claim 1, it is submitted that these claims are patentable over Joko et al. for the same reasons as claim 1 discussed above. Additionally, claim 40 recites “computer executable instructions for receiving application environment parameters through a user interface.” As explained above with regard to claim 16, Joko et al. fail to teach or suggest this limitation. The remaining claims rejected under 35 USC 102(b) depend either directly, or indirectly, from respective claim 20, 29 or 40 and therefore are not anticipated for the same reasons as well as because of the additional limitations contained therein.

Accordingly, Applicant respectfully requests that the rejection of claims 1-4, 12-18, 20-22, 29-32, and 36-42 under 35 U.S.C. §102(b) be withdrawn. Moreover, as these claims have not been rejected under 35 U.S.C. §103(a), Applicant respectfully submits that these claims should be allowed.

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Rejections Under 35 U.S.C. § 103(a)Claims 5, 19, 23, 33 and 43-44

The Examiner rejected claims 5, 19, 23, 33 and 43-44 under 35 USC § 103(a) as being unpatentable over Joko et al. in view of Adams (U.S. Patent No. 4,435,675). The Examiner's rejection has been carefully considered but is traversed for the reasons that follow.

As discussed above, Joko et al. do not disclose, teach or suggest all the features as recited in independent claims 1, 16, 20, 29 and 40 which are the respective base claims for these dependent claims. Adams is directed to a battery charging system that determines the state of charge of the battery at the commencement of charging and selects a charging schedule based on the state of charge of the battery. As with Joko et al., Adams fails to teach or suggest determining one or more energy needs for the application environment. Therefore, Applicant respectfully submits that Adams fails to remedy the defects of Joko et al. Even if one skilled in the art were to combine the teachings of Joko et al. and Adams, the resulting apparatus or methods would not be the same as those defined by claims 5, 19, 23, 33 and 43-44, and therefore these claims are not obvious.

Additionally, Applicant respectfully submits that one skilled in the art would have no motivation to combine the teachings of Joko et al. with Adams. The Examiner states that it would have been obvious to a person having ordinary skill in the art at the time of this invention to combine Adams's battery charging system with a charge schedule and Joko et al.'s battery control system to maximize the charge provided to the battery for a given period of time. Applicant submits that the charge schedule of Adams cannot be combined with the hybrid vehicle system of Joko et al, because regenerative braking, which is the charge mechanism of Joko et al. is unscheduled and highly variable in duration. Thus, there is a lack of suggestion to combine the references.

Accordingly, Applicant respectfully requests that the rejection of claims 5, 19, 23, 33 and 43-44 under 35 USC § 103(a) be withdrawn.

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Claims 6-9 and 34

The Examiner rejected claims 6-9 and 34 under 35 USC § 103(a) as being unpatentable over Joko et al. in view of Notten et al. (U.S. Patent No. 6,016,047). The Examiner's rejection has been carefully considered but is traversed for the reasons that follow.

As discussed above, Joko et al. do not disclose, teach or suggest all the features as recited in independent claims 1 and 29 which are the respective base claims for these dependent claims. Applicant respectfully submits that Notten et al. fail to remedy the defects of Joko et al. In view of the differences between Joko et al. and the present invention as defined by the claims, it is submitted that even if one skilled in the art were to combine the teachings of Joko et al. and Notten et al., the resulting apparatus or methods would not be the same as those defined by claims 6-9 and 34, and therefore these claims are not obvious.

Accordingly, Applicant respectfully requests that the rejection of claims 6-9 and 34 under 35 USC 103(a) be withdrawn.

Claim 10

The Examiner rejected claim 10 under 35 USC 103(a) as being unpatentable over Joko et al. in view of Notten et al. (U.S. Patent No. 6,016,047) and further in view of L. Martin (Journal of Heat Transfer, Nov. 1991, Vol. 113/899). The Examiner's rejection has been carefully considered but is traversed for the reasons that follow.

As discussed above, Joko et al. do not disclose, teach or suggest all the features as recited in independent claim 1 which is the base claim for dependent claim 10. Applicant respectfully submits that Notten et al. and L. Martin fail to remedy the defects of Joko et al. with regard to claim 1. In view of the differences between Joko et al. and the present invention as defined by claim 1, it is submitted that even if one skilled in the art were to combine the teachings of Joko et al., Notten et al. and Martin, the result would not be the same as the method defined by claim 10, and therefore claim 10 is not obvious.

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Accordingly, Applicant respectfully requests that the rejection of claim 10 under 35 USC § 103(a) be withdrawn.

Claim 11

The Examiner rejected claim 11 under 35 USC §103(a) as being unentenable over Joko et al. in view of Hughes et al. (U.S. Patent No. 6,326,765). The Examiner's rejection has been carefully considered but is traversed for the reasons that follow.

As discussed above Joko et al. do not disclose, teach or suggest all the features as recited in independent claim 1 which is the base claim for dependent claim 11. Applicant respectfully submits that Hughes et al. fail to remedy the defects of Joko et al. In view of the differences between Joko et al. and the present invention as defined by claim 1, it is submitted that even if one skilled in the art were to combine the teachings of Joko et al. and Hughes et al., the result would not be the same as the method defined by claim 11, and therefore claim 11 is not obvious.

Additionally, Applicant respectfully submits that one skilled in the art would have no motivation to combine Joko et al. with Hughes et al. Hughes et al. is directed to an electric scooter with an on-board charging system. The Examiner states that it would have been obvious to a person having ordinary skill in the art at the time of this invention to use Hughes et al.'s charging method, which according to the Examiner includes using an IVI profile with Joko et al.'s device to provide a full charge to the battery in less time than typical charging methods. Applicant respectfully disagrees.

As explained in Fig. 3 and in the specification in col. 2, line 1 to col. 3, line 17, Hughes et al.'s charging method referred to by the Examiner is used with a steady power source, namely a fuel cell for charging a battery pack. Applicant submits that the charging method of Hughes et al. cannot be combined with the hybrid vehicle system of Joko et al., because regenerative braking, which is the charge mechanism of Joko et al. is unscheduled and highly variable in duration. Thus, there is a lack of suggestion to combine the references.

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Accordingly, Applicant respectfully requests that the rejection of claim 11 under 35 USC § 103(a) over Joko et al. in view of Hughes et al. be withdrawn.

The Examiner rejected claim 11 under 35 USC §103(a) as being unpatentable over Joko et al. in view of Aker et al. (U.S. Patent No. 6,803,746). The Examiner's rejection has been carefully considered but is traversed for the reasons that follow.

As discussed above Joko et al. do not disclose, teach or suggest all the features as recited in independent claim 1 which is the base claim for dependent claim 11. Applicant respectfully submits that Aker al. fail to remedy the defects of Joko et al. In view of the differences between Joko et al. and the present invention as defined by claim 1, it is submitted that even if one skilled in the art were to combine the teachings of Joko et al. and Aker et al., the result would not be the same as the method defined by claim 11, and therefore claim 11 is not obvious.

Additionally, Applicant respectfully submits that one skilled in the art would have no motivation to combine the battery control system of Joko et al. with the high capacity charger taught by Aker et al. Applicant respectfully submits that one skilled in the art would not be motivated to combine the regenerative braking system of Joko et al., which is unscheduled and highly variable in duration, with the high capacity charger taught by Aker et al. Thus, there is a lack of suggestion to combine the references.

Accordingly, Applicant respectfully requests that the rejection of claim 11 under 35 USC § 103(a) over Joko et al. in view of Aker et al. be withdrawn.

Claims 24-27

The Examiner rejected claims 24-27 under 35 USC §103(a) as being unpatentable over Joko et al. in view of Adams and further in view of Hughes et al. The Examiner also rejected claims 24-27 under 35 USC §103(a) as being unpatentable over Joko et al. in view of Adams and further in view of Aker et al. The Examiner's rejections have been carefully considered but are traversed for the reasons that follow.

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As discussed above, Joko et al. do not disclose, teach or suggest all the features as recited in independent claim 20 which is base claim for these dependent claims. As discussed above, Adams, Hughes et al., and Ankers et al. fail to remedy the defects of Joko et al. Moreover, as discussed above, Applicant respectfully submits that one skilled in the art would have no motivation to combine the system of Joko et al. with Adams, Hughes et al., or Aker et al.

Accordingly, Applicant respectfully requests that the rejections of claims 24-27 under 35 § USC 103(a) over Joko et al. in view of Adams and further in view of Hughes et al. and over Joko et al. in view of Adams and further in view of Aker et al. be withdrawn.

Claim 28

The Examiner rejected claim 28 under 35 USC § 103(a) as being unpatentable over Joko et al. in view of Adams in view of Hughes et al. in further view of Koenck (U.S. Patent No. 5,463,305) and as being unpatentable over Joko, Adams, and Aker et al. in further view of Koenck. The Examiner's rejections have been carefully considered but are traversed for the reasons that follow.

As discussed above, Joko et al. do not disclose, teach or suggest all the features as recited in independent claim 20 which is base claim for these dependent claims. As discussed above, Adams, Hughes et al., and Aker et al. fail to remedy the defects of Joko et al. Moreover, as discussed above, Applicant respectfully submits that one skilled in the art would have no motivation to combine the system of Joko et al. with Adams, Hughes et al., or Aker et al. Applicant respectfully submits that Koenck fails to remedy the defects of Joko et al. Moreover, Applicant respectfully submits that the need to rely on a combination of four references as a basis for obviousness amounts to a hindsight analysis which in itself supports a finding that the invention is not obvious.

Accordingly, Applicant respectfully requests that the rejections of claim 28 under 35 USC § 103(a) over Joko et al. in view of Adams in view of Hughes et al. in further view of Koenck and over Joko, Adams, and Aker et al. in further view of Koenck be withdrawn.

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Claim 35

The Examiner rejected claim 35 under 35 USC §103(a) as being unpatentable over Joko et al. in view of Notten et al. and further in view of Hughes et al. The Examiner also rejected claim 35 under 35 USC §103(a) as being obvious over Joko et al. in view of Notten et al., and further in view of Aker et al. The Examiner's rejections have been carefully considered but are traversed for the reasons that follow.

As discussed above, Joko et al. do not disclose, teach or suggest all the features as recited in independent claim 29 which is the base claim for dependent claim 35. As discussed above, Notten et al., Hughes et al. and Aker et al. all fail to remedy the defects of Joko et al. Moreover, as discussed above, Applicant respectfully submits that one skilled in the art would have no motivation to combine the system of Joko et al. with Hughes et al. or Aker et al.

Accordingly, Applicant respectfully requests that the rejections of claim 35 under 35 USC §103(a) over Joko et al. in view of Notten et al. and further in view of Hughes et al. and over Joko et al. in view of Notten et al., and further in view of Aker et al. be withdrawn.

Claim 45

Finally, the Examiner rejected claim 45 under 35 USC § 103(a) as being unpatentable over Joko et al. in view of Adams in further view of Koench. The Examiner's rejection has been carefully considered but is traversed for the reasons that follow.

As discussed above, Joko et al. do not disclose, teach or suggest all the features as recited in independent claim 40 which is the base claim for dependent claim 45. As discussed above, Adams and Koench fail to remedy the defects of Joko et al. Moreover, as discussed above, Applicant respectfully submits that one skilled in the art would have no motivation to combine the system of Joko et al. with Adams.

Accordingly, Applicant respectfully requests that the rejection of claim 35 under 35 USC §103(a) over Joko et al. in view Adams in further view of Koench be withdrawn.

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CONCLUSION

In view of the above remarks, Applicant respectfully submits that this application is in condition for allowance. Accordingly, reconsideration and a timely indication of allowance are respectfully requested.

If the Examiner believes a telephone conference would aid in the prosecution of this application, then the Examiner is invited to contact the undersigned at the below-listed telephone number.

A fee of \$1,020.00 is believed due for a 3 month extension of time to respond to the Office action. The Commissioner is authorized to charge this fee and any other fees due with this Response to Deposit Account No. 19-2090.

Respectfully submitted,
SHELDON & MAK PC

Date: December 15, 2005

By: 

Marc Karish
Reg. No. 44,816

SHELDON & MAK PC
225 South Lake Avenue, 9th Floor
Pasadena, California 91101-3005
Telephone 626.796.4000
Facsimile 626.795.6321